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**ENGINEERING OPERATIONS COMMITTEE**
**MEETING MINUTES**
**NOVEMBER 2, 1995, 9:00 A.M.**
**EXECUTIVE CONFERENCE ROOM**

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| Present: | R. A. Welke | T. A. Coleman | G. D. Taylor |
| | C. Roberts | J. W. Reincke | P. A. Lynwood (P. Miller) |
| | L. R. Brown | J. D. O'Doherty | R. S. Cadena (D. VanDenberg) |
| | R. E. Maki | | |
| Guest: | T. Fort (FHWA) | W. C. Turner | R. L. Vibbert |
| | I. B. Patel | | |

OLD BUSINESS

1. **Approval of the Minutes of the October 5, 1995, Meeting - R. A. Welke**

   Minutes of the October 5, 1995, meeting were approved as written.

2. **Lane Miles/Data Uniformity - W. C. Turner/R. L. Vibbert**

   This item was discussed at the October 1995 meeting (refer to New Business Item 1), regarding the need of a departmental procedure for a lane mileage accounting process to ensure more accurate numbers and that a realistic picture of the statewide system is provided. Tom Coleman, as a follow-up to the October meeting, contacted the district engineers to ascertain their procedural approach to provide lane miles data for their district. In conclusion, the comments received from the districts revealed that we have a problem in that no consensus of how the system approach is used for reporting lane mile data.

   Ron Vibbert of Planning provided an overview of the activities underway to develop a physical road reference system, as required by ISTEA. The existing physical road system, which is presently operated by the Michigan State Police, has a lot of duplication and redundancy. Other than the following exceptions, the Maintenance Division does not have any problem with the conversion.

   A. County contracts are in E miles.
   B. The wider lanes (16 ft center turn lane) must not be counted as one lane.
   C. Ramps must not be counted as one lane.

   A major goal for the system is to provide a rational data base and useful system for all applications.

3. **Guardrail Inventory - R. E. Maki**

The Traffic and Safety Division and the Design Division's Pavement Management Unit are working to develop a plan that would upgrade the guardrail inventory using the pavement management system video system. Currently, the state highway system and local NHS routes are video taped on a two year cycle to define pavement distress. This year the consultants who do the videos will be asked to add two cameras to their van to allow the shoulders to be photographed. These same films can be used to inventory the guardrail, utilizing the same people who do pavement management.

The guardrail inventory data would be available by the end of 1996 for the M non-freeway routes. The US and I routes, and M freeways would be available by the end of 1997. Ramps are not currently being videotaped. To update the inventory on ramps and crossroads in interchange areas, the Traffic and Safety photolog system is proposed to accomplish this task. Traffic and Safety employees would be used to input these data.

The video system will make it possible to collect the majority of information that is on the current inventory. It will provide all the information necessary to determine needs for future guardrail upgrading projects, and accurate scoping information for designers to use when estimating costs. This system could also be used to inventory concrete barrier wall locations. Portions of the guardrail inventory will be incorporated into the Transportation Management System database.

The inventory would be updated every other year, or at the same time as the videos are taken for the Pavement Management System. CPRKS will be analyzed to see if guardrail revised or put in by contract can be added to the inventory in an automated fashion. The Traffic and Safety Division representative on the Maintenance Management System should endeavor to have automated update capabilities for guardrail maintenance.

**ACTION:** EOC approved the conceptual proposal with the stipulation that the system design provide for input of new data required to maintain a comprehensive roadway inventory, as well as providing an interim roadway data source to address the work activities on-going in Maintenance.

4. **Work Zone Certification - R. E. Maki**

The Work Zone Committee conducted a review of various state DOTs as part of their efforts to ascertain current practices in place requiring a certified work zone supervisor during construction. In conjunction with their review, specific questions were addressed, as discussed at the September EOC meeting. The committee agreed that traffic operation can be improved in construction work zones by requiring a certified work zone supervisor.

**ACTION:** EOC approved the recommendation requiring a certified work zone supervisor, as a separate pay item, with the stipulation that the Work Zone Committee meet with industry representatives to

develop a program for implementation. Maintenance will coordinate departmental programs related to routine maintenance, construction, and permit activities.

NEW BUSINESS

1. **Approval for 1996 Concrete Quality Assurance/Quality Control (QA/QC) Trial Projects - C. Roberts**

A proposed list of 20 concrete QA/QC trial projects (14 bridge and 6 road projects), for the 1996 construction season was presented for approval. In addition to these 20 new projects, the trial program includes 4 previously approved projects that are expected to be let in 1995; 9 previously approved projects that have been pushed forward into fiscal year 1995-96; 9 projects currently under construction that will carry over into the 1996 construction season; and 9 active projects that will likely be completed this construction season.

As part of our QA/QC departmental activities in conjunction with interest expressed by various representative groups, an assessment of projects as related to QA/QC and contractor's quality control is presently underway. The Office of Management Assessment will have a first draft of the report completed by the end of November, with the final report being available by the end of January 1996.

**ACTION:** EOC approved the 20 concrete QA/QC trial projects, as presented.

2. **Modeling of Snowplow Forces for Truck Frame Design - J. D. O'Doherty**

A review of MDOT's maintenance activities has revealed a clear, identified, need for a snow plow force model, including the effects arising from road friction, snow compressibility, viscosity and re-entrant snow, which accurately estimates the forces and moments upon truck frames. An engineering model, used as part of the manufacturing process to compute snow plow forces accurately, does not currently exist. Present procurement practices, within state DOTs Maintenance Departments, requires specification of frame structural properties that over design the truck and add significant costs to the truck purchase.

The objective of this research program is to develop a mathematical snow plow model that includes road, friction, snow compressibility, viscosity and re-entrant snow effects. As part of a research consortium, involving the Great Lakes Center for Truck and Transit Research and Ford Motor Company, approval for funding MDOT's contribution in the proposed research is requested.

**ACTION:** EOC approved funding for MDOT participation in the proposed program.

3. **Research Report No. R-1321, "A Comparison of the Corrosion Performance of Uncoated, Galvanized, and Epoxy Coated Reinforcing Steel in Concrete Bridge Decks" (Attachment) - J. W. Reincke**

The objectives of Research Projects 68 F-103 and 73 F-131 were to compare the long-term performance of galvanized and epoxy coated reinforcing steel with uncoated reinforcement, as well as the effect increased concrete cover and concrete mix design might have on the life of reinforced concrete bridge decks. Only the long-term performance on the reinforcement alternative. Following are the findings of the research.

The current MDOT Guidelines and Procedures, which recommend the use of epoxy coated reinforcement in both the top and bottom mat of reinforcing steel, probably represents the most cost-effective corrosion protection of steel reinforcement currently available. For the present time, the use of these guidelines, as written, should continue in combination with three-inch clear cover.

Galvanized concrete reinforcement is not recommended for use in Michigan's highway structures.

The performance of epoxy-coated reinforcement, as well as possible alternative corrosion protection methods (i.e. modifications to the reinforcement-different coatings or reinforcement materials and modifications to the concrete that affect its porosity, shrinkage, or resistance to cracking), should continue to be evaluated. Continued examination of alternatives will help ensure that MDOT implements the most cost-effective corrosion protection methods available.

**ACTION:** EOC approved Research Report R-1321, as presented.

4. **Research Report No. R-1336, "Proof Load Test of R01 of 61131 M-37 Over CSX Railroad, South of Bailey, Michigan" (Attachment) - J. W. Reincke**

On October 27, 1994, the Bridge Management Unit requested a load test of the 68-year-old bridge carrying M-37 over the CSX railroad, 1.1 miles south of Bailey (structure number R01 of 61131). The structure, a three-span, reinforced concrete T-beam bridge, built in 1927, was in poor condition, as the 1994 bridge inspection report shows. The "Structure Inventory and Appraisal" report gave the bridge an overall appraisal rating of 2, which by definition states "basically intolerable, requiring priority of replacement." The deck, stringers (beam stems), piers, and slope protection all received serious ratings. The bridge had a load restriction of 29 tons for a Michigan type one-unit vehicle, and a load restriction of 45 tons for a Michigan type two or three-unit vehicle.

Because the bridge successfully carried the 82-ton proof load with no detectable distress during the load test in November 1994, it was recommended the Bridge Management Unit keep the existing posted loading of 45 tons for a two-unit, 11 axle vehicle. However, the posting should not exceed 45 tons, due to the condition of the fascia beams. The Bridge Management Unit concurred with the recommendation and the bridge was opened to traffic in November 1994.

It is recommended the department continue efforts to replace this bridge. The fascia beams and piers are in serious condition and the concrete overlay is deteriorating rapidly. The Design Division should review this report's findings and the above referenced analysis to determine if they concur with the current bridge posting.

The Maintenance Division should continue to monitor the structure on a six month inspection schedule, with emphasis on the fascia beam, condition of the deck, shear cracks in the end spans, and condition of the piers.

In May 1995, the bridge was inspected and the concrete overlay was found to be deteriorating rapidly, and it was separating from the deck at the piers. This prompted a reanalysis of the structure with new assumptions. The 45 ton, two-unit vehicle posting was found to still be adequate. If the structure remains in service for more than five years, it is recommended that the department repair the two fascia beams and the interior beams that are in poor condition, and retest the structure to detect further deteriorations and consequent loss of load capacity.

**ACTION:** The EOC approved Research Report R-1336, as presented, with appropriate action taken by the Design and Maintenance Divisions.

5. **Pavement Selection - Experimental Project, Vining Road and I-94 Interchange, Wayne County (Info was Distributed at the Meeting) - C. J. Arnold/I. B. Patel**

MDOT, in agreement with the City of Romulus and a local developer, will let this contract as a Design-Build job. This project will provide increased access to the interstate, additional access to the airport and reduce congestion on the local network. Scheduled for the spring of 1996, the scope of work includes construction of auxiliary lanes, ramps and a portion of Vining Road. A request for approval of concrete and bituminous sections for the auxiliary lanes and ramps are as follows:

**Auxiliary Lanes and Shoulder Construction**

*Alternate 1*

10 in. . . . . Reinforced Concrete Pavement (41 ft joint)
10 to 7 in. . . . . Reinforced Concrete or Bituminous Shoulders
4 in. . . . . Open Graded Drainage Course Geotextile Separator
12 in. . . . . Sand Subbase With Underdrains

*Alternate 2*

1½ in. . . . . Bituminous Mix "4C" Top Course
1½ in. . . . . Bituminous Mix "3C" Leveling Course
7 in. . . . . Bituminous Mix "11A" Base Course (Mainlines)
10 to 7 in. . . . . Bituminous Shoulders (7 to 4 in. Bituminous Base Mix "11A")
6 in. . . . . Aggregate Base Course
18 in. . . . . Sand Subbase With Underdrains

**Ramps Construction**

*Alternate 1*

9 in. . . . . Reinforced Concrete Pavement (41 ft joint)
9 to 7 in. . . . . Reinforced Concrete Shoulders or 5 in. Bituminous Shoulders
4 in. . . . . Open Graded Drainage Course Geotextile Separator

12 in. . . . . Sand Subbase With Underdrains

*Alternate 2*

1½ in. . . . . Bituminous Mix "4B" Top Course
1½ in. . . . . Bituminous Mix "3B" Leveling Course
4 in. . . . . Bituminous Mix "11A" Base Course (Mainlines)
7 to 5 in. . . . . Bituminous Shoulders (4 to 2 in. Bituminous Base Mix "11A")
6 in. . . . . Aggregate Base Course
18 in. . . . . Sand Subbase With Underdrains

The AASHTO Guide (Program NSPS86 - Version 2, April 1987) for Design of Pavement Structures is used for the design of Alternates 1 and 2.

**Recommendation:** The acceptance of either Alternate 1 or Alternate 2 (both have design life of 20 years) is proposed and their are no objections to the contractor selecting Alternate 1 or Alternate 2 for its pavement construction. Other alternatives from the Design Build Team will be accepted if their alternatives meet AASHTO's 20 years design life and MDOT's 35 years service life criteria. The alternatives must also be approved by MDOT's pavement design engineer and the district soils engineer.

**ACTION:** The EOC approved the Design-Build pavement option, with the stipulation that the Design Division will review the proposed 41 ft joints for the ramp section to shorter spacing, if possible.

6. **General Material Requirements: Warranty Clauses (FHWA) - C. Roberts**

The FHWA has implemented an interim final rule, effective as of August 25, 1995, that will permit greater use of warranties on federal-aid highway construction contracts. Previously, warranty clauses were generally prohibited with limited exception. Now the warranty clause regulation is being revised to permit states to include warranty provisions covering specific construction products or features on National Highway System Federal-Aid Contract, but maintenance items not eligible for federal-aid funds cannot be included. The EOC felt that a project should be selected for a pilot test.

**ACTION:** The Materials and Technology Division will coordinate with the Design Division to propose a project during 1996. In addition, representatives from the Wisconsin DOT should be contacted to discuss their experiences, as well as review their specifications for possible application in Michigan.

(Signed Copy on File at M&T)
Calvin Roberts, Secretary
Engineering Operations Committee

cc: EOC Members

District Engineers

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|---|---|---|---|
| G. H. Grove | G. J. McCarthy | L. K. Heinig | T. Adams |
| E. D. Winkler | D. L. Coleman | W. C. Turner | D. L. Smiley |
| L. W. Martin | J. Becsey | R. W. Muller | R. E. Nordlund |
| L. E. DeFrain | G. L. Mitchell | G. J. Bukoski | C. W. Whiteside |
| I. B. Patel | R. D. Till | M. Newman | A. G. Ostensen |